

7. Guadalupe

Program Name: Guadalupe.java

Input File: guadalupe.dat

Many rumors have been flying around at school. Guadalupe has been trying to figure out how certain people have been keeping up with the gossip. To do this, Guadalupe has set up a camera by the water cooler and noticed that when two or more people are at the water cooler at the same time, they exchange all the gossip they have heard that day with each other. Guadalupe wants your help to model the findings from the time people are at the water cooler to the information they know.

Thanks to Guadalupe's camera, she knows exactly who came and went from the water cooler, and what times each person arrived and left. When two or more people are at the water cooler, they tell each other all of the gossip that they knew at the start of the day as well as all of the gossip they have been told by others during the day. For example, if Amelia sees Juan at the water cooler in the afternoon, she will tell him everything she knew at the start of the day, plus everything she learned from José earlier in the day. Likewise, Juan will tell Amelia everything he knows or has learned up until that point as well. At the end of the day, Amelia will know José's, Juan's, and her own gossip. Juan will know Amelia's, Jose's, and his own gossip. But Jose will only know Amelia's and his own gossip.

Now, given the information from Guadalupe's camera, determine who, at the end of the day, has heard whose gossip, assuming that all gossip is exchanged at the water cooler and only at the water cooler.

Input: The first integer will represent the number of data sets to follow. The first line of each data set will consist of an integer, N, representing the number of people Guadalupe caught on camera during the current day. Each of the next N lines will begin with the firstname (containing no spaces or punctuation) of the person that the camera saw, followed by a pair of times (represented in 24-hour time). Each of these pairs of times represents when the person arrived at the water cooler and when they left, respectively.

Output: Each data set should print a line of output for each person Guadalupe saw on camera in the order that they first arrived at the water cooler for the day. This string should read: "<NAME> has heard gossip from: <GOSSIP>" where <GOSSIP> is the alphabetized list of names whose stories <NAME> has heard either directly or indirectly throughout the day. Note: A person, by default, has heard their own gossip. Therefore, each person's name should be included in their own list of<GOSSIP>. Each data set should be followed by a blank line.

Assumptions: All times expressed will be valid times. All meetings will have an end time at least one minute later than their start time. All times given for a person's schedule will be in chronological order and will not wrap around the day (meaning the earliest time will be midnight -- 0:00 -- and the latest will be 23:59). Times are represented up to but not including the end-time. Thus, if someone arrived at 14:01 and left at 14:02 and someone arrived at 14:00 and left at 14:01, these two people did not overlap at the water cooler and did not exchange information.

Sample Input:

```
3
4
AMELIA 1:20 1:25 2:35 2:50
JOSE 2:30 2:35
JUAN 2:34 2:38
JESUS 2:37 2:40
4
NOLAN 1:20 1:25 2:35 2:50 23:50 23:59
DULCE 2:30 2:45
DESERAY 2:34 2:38
PEDRO 2:37 2:40
5
SHARON 8:30 8:50
IRFAN 8:45 9:10
STEPHANIE 9:00 9:23
KARIBU 9:20 9:30
MURICA 9:29 9:50
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Sample Output:

AMELIA has heard gossip from: AMELIA JESUS JOSE JUAN
JOSE has heard gossip from: JOSE JUAN
JUAN has heard gossip from: AMELIA JESUS JOSE JUAN
JESUS has heard gossip from: AMELIA JESUS JOSE JUAN

NOLAN has heard gossip from: DESERAY DULCE NOLAN PEDRO
DULCE has heard gossip from: DESERAY DULCE NOLAN PEDRO
DESERAY has heard gossip from: DESERAY DULCE NOLAN PEDRO
PEDRO has heard gossip from: DESERAY DULCE NOLAN PEDRO

SHARON has heard gossip from: IRFAN SHARON
IRFAN has heard gossip from: IRFAN SHARON STEPHANIE
STEPHANIE has heard gossip from: IRFAN KARIBU SHARON STEPHANIE
KARIBU has heard gossip from: IRFAN KARIBU MURICA SHARON STEPHANIE
MURICA has heard gossip from: IRFAN KARIBU MURICA SHARON STEPHANIE